


<https://doi.org/10.5281/zenodo.3401544>

Research Article

GRAPHIC DISPLAYS OF MANAGERIAL BUSINESS LOGISTICS			Economics Keywords: logistics, management, business, supply chain logisticians and transport links.
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Abstract			
<p>According to the Council of Supply Chain Management Professionals (CSCMP), logistics management can be defined as “that part of supply chain management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements.” The history of logistics is rooted in its military application. Since WWII it has developed into an important function of business as it became evident that logistics and transportation add place and time value to products and enhance the form and possession value added by manufacturing and marketing. One definition of business logistics speaks of “having the right item in the right quantity at the right time at the right place for the right price in the right condition to the right customer”. Business logistics incorporates all industry sectors and aims to manage the fruition of project life cycles, supply chains, and resultant efficiencies. The term “business logistics” has evolved since the 1960s due to the increasing complexity of supplying businesses with materials and shipping out products in an increasingly globalized supply chain, leading to a call for professionals called “supply chain logisticians”. In business, logistics may have either an internal focus (inbound logistics) or an external focus (outbound logistics), covering the flow and storage of materials from point of origin to point of consumption (see supply-chain management). The main functions of a qualified logistician include inventory management, purchasing, transportation, warehousing, consultation, and the organizing and planning of these activities. Logisticians combine a professional knowledge of each of these functions to coordinate resources in an organization. There are two fundamentally different forms of logistics: one optimizes a steady flow of material through a network of transport links and storage nodes, while the other coordinates a sequence of resources to carry out some project (e.g., restructuring a warehouse).</p>			

Introduction

Logistics is generally the detailed organization and implementation of a complex operation. In a general business sense, logistics is the management of the flow of things between the point of origin and the point of consumption in order to meet requirements of customers or corporations. The resources managed in logistics may include tangible goods such as materials, equipment, and supplies, as well as food and other consumable items. The logistics of physical items usually involves the integration of information flow, materials handling, production, packaging, inventory, transportation, warehousing, and often security.

In military science, logistics is concerned with maintaining army supply lines while disrupting those of the enemy, since an armed force without resources and transportation is defenseless. Military logistics was already practiced in the ancient world and as modern military have a significant need for logistics solutions, advanced implementations have been developed. In military logistics, logistics officers manage how and when to move resources to the places they are needed.

Logistics management is the part of supply chain management that plans, implements, and controls the efficient, effective forward, and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet

customer's requirements. The complexity of logistics can be modeled, analyzed, visualized, and optimized by dedicated simulation software. The minimization of the use of resources is a common motivation in all logistics fields. A professional working in the field of logistics management is called a logistician

1. Global logistic

The expansion of the global marketplace puts the concept of global logistics into the limelight. Logistics experts must now manage all of the aforementioned logistics activities within a worldwide arena spanning a multitude of countries, languages, cultures, governments, and regulations. Along with this expansion of the marketplace comes the need for global channel intermediaries. Today's global logistics manager would be familiar with the role of each of the following:¹

Foreign freight forwarders—handlers of myriad foreign freight services such as rate quotes, vessel chartering, booking of vessel space, handling of documentation and cargo insurance, tracing and expediting, arranging inland transportation, and providing translation services.

Export management companies—suppliers of expertise to those wishing to sell products overseas but lacking the necessary resources.

Export trading companies—locators of overseas buyers. They also handle export documentation, transportation, and the meeting of foreign government requirements. Customs house brokers—overseers of the movement of goods through customs. They also ensure that accompanying documents are complete and accurate. Ship brokers—sales representatives for ship owners and purchasing representatives for the shipper. Ship agents—local representative of the ship operator that handles the ship's arrival, berthing, clearance, loading, and unloading. Export packers—suppliers of export packaging services. Port authorities—owner and operator of the port. They provide wharf, dock, and other terminal facilities at port locations.

As the global market continues to expand, there is an increasing need for real-time logistics data in order to make decisions across the supply chain. Thus, a number of software companies now offer products designed specifically for the logistics and transportation industry. These products provide information like GPS tracking, automatic vehicle routing, and instantaneous updates on route progress. One such product, TerritoryPro by Appian Logistics, creates maps of optimal sales and delivery territories based on information about volume, workload, and other constraints. As the market for more sophisticated global logistics software continues to grow, the logistics and transportation industry is sure to continue its trend toward increased automation of tasks formerly performed by human beings.²

¹ Hugo, M. (2013). *Essentials of Supply Chain Management*. New Jersey: John Wiley & Sons Inc.

² Hugo, M. (20013). *Essentials of Supply Chain Management*. New Jersey: John Wiley & Sons Inc.

2. What is Logistics and Supply Chain Management?

"Logistics typically refers to activities that occur within the boundaries of a single organization and Supply Chain refers to networks of companies that work together and coordinate their actions to deliver a product to market. Also, traditional logistics focuses its attention on activities such as procurement, distribution, maintenance, and inventory management. Supply Chain Management (SCM) acknowledges all of traditional logistics and also includes activities such as marketing, new product development, finance, and customer service" - Michael Hugos

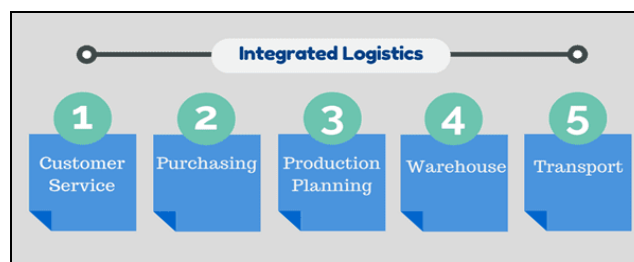
Picture 1. Supply Chain Management



Sources: Mallik, Susan (2010). "Customer Service in Supply Chain Management". In Hossein Bidgoil (ed.). *The Handbook of Technology Management: Supply Chain Management, Marketing and Advertising, and Global Management*, vol 2 (1 ed.). Hoboken, New Jersey: *John Wiley & Sons*. p. 104. *ISBN 978-0-470-24948-2*.

"Logistics is about getting the right product, to the right customer, in the right quantity, in the right condition, at the right place, at the right time, and at the right cost (the 7 Rs)" - John J. Coyle et al. In the past, various tasks were under different departments, but now they are under the same department and report to the same head as below.³

Picture 2. Integrated logistics



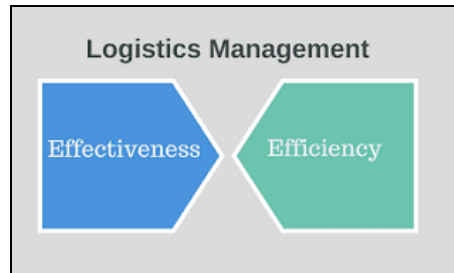
Sources: - Coyle, J. J., Langley, C. J., Novack, R. A., & Gibson, B. (2016). *Supply chain management: a logistics perspective*. Nelson Education.

³ Coyle, J. J., Langley, C. J., Novack, R. A., & Gibson, B. (2016). *Supply chain management: a logistics perspective*. Nelson Education.

What is Logistics Management?

"Logistics Management deals with the efficient and effective management of day-to-day activity in producing the company's finished goods and services" - Paul Schönsleben

Picture 3. Economic components of management logistics

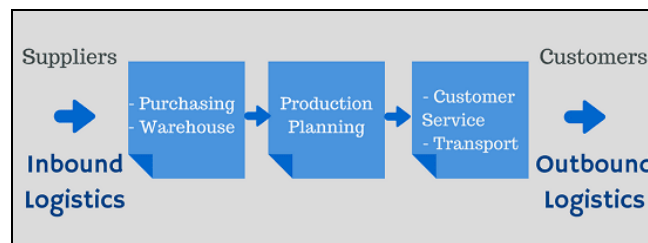


Sources: - Schönsleben, P. (2017). Integral logistics management: Operations and supply chain management in comprehensive value-added networks. Auerbach Publications.

What is the Difference Between Inbound Logistics and Outbound Logistics?

"Inbound Logistics refers to movement of goods and raw materials from suppliers to your company. In contrast, Outbound Logistics refers to movement of finished goods from your company to customers"

Picture 4. Current Suppliers and Customers



Sources: Schönsleben, P. (2017). Integral logistics management: Operations and supply chain management in comprehensive value-added networks. Auerbach Publications.

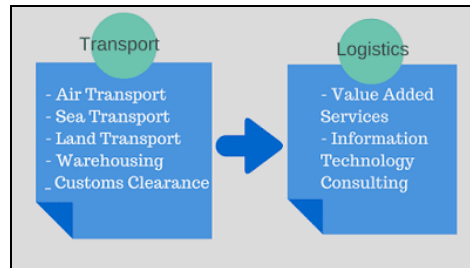
As you can see, purchasing function and warehouse (distribution center) communicates with suppliers and sometimes called "supplier facing function". Production planning and inventory control function is the center point of this chart. Customer service and transport function communicates with customers and sometimes called "customer-facing functions".⁴

⁴ Mentzer, J. T., DeWitt, W., Keebler, J. S., Min, S., Nix, N. W., Smith, C. D., & Zacharia, Z. G. (2018). Defining supply chain management. Journal of Business logistics, 22(2), 1-25.

What are the Transport and Logistics?

"Transport and Logistics refers to 2 types of activities, namely, traditional services such as air/sea/land transportation, warehousing, customs clearance and value-added services which including information technology and consulting"

Picture 5 Transport and logistics activities



Sources: Mentzer, J. T., DeWitt, W., Keebler, J. S., Min, S., Nix, N. W., Smith, C. D., & Zacharia, Z. G. (2018). Defining supply chain management. *Journal of Business logistics*, 22(2), 1-25.

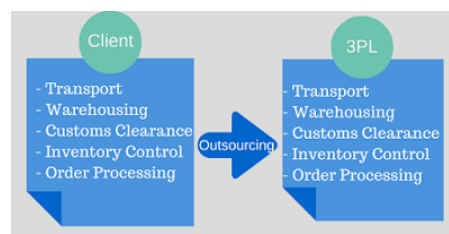
3. International Logistics?

These are one of the most ambiguous groups of terms out there. They are used interchangeably with international supply chain or international production and transportation activities. However, the most concise definition is as below, "International Logistics focuses on how to manage and control overseas activities effectively as a single business unit. Therefore, companies should try to harness the value of overseas product, services, marketing, R&D and turn them into competitive advantage"

What is Third Party Logistics or 3PL?

The concept of 3PL appeared on the scene in the 1980s as the way to reduce costs and improve services which can be defined as below, "Third Party Logistics or 3PL refers to the outsourcing of activities, ranging from a specific task, such as trucking or marine cargo transport to broader activities serving the whole supply chain such as inventory management, order processing and consulting."

Picture 6. Concept of 3PL



Sources: Donald Bowersox, David Closs, M. Bixby Cooper, *Supply Chain Logistics Management*, McGraw-Hill 2012.

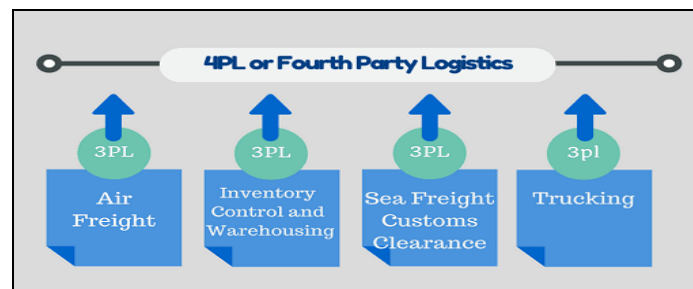
In the past, many 3PL providers didn't have adequate expertise to operate in complex supply chain structure and process. The result was the inception of another concept.

What is Fourth Party Logistics or 4PL?

The 4PL is the concept proposed by Accenture Ltd in 1996 and it was defined as below,

"Fourth Party Logistics or 4PL refers to a party who works on behalf of the client to do contract negotiations and management of performance of 3PL providers, including the design of the whole supply chain network and control of day-to-day operations".⁵

Picture 7. Fourth Party Logistics or 4PL



Sources: Mentzer, J. T., DeWitt, W., Keebler, J. S., Min, S., Nix, N. W., Smith, C. D., & Zacharia, Z. G. (2018). Defining supply chain management. *Journal of Business logistics*, 22(2), 1-25.

You may wonder if a 4PL provider is really needed. According to the research by Nezar Al-Mugren from the University of Wisconsin-Stout, the top 3 reasons why customers would like to use 4PL providers are as below:⁶

- Lack of technology to integrate supply chain processes
- The increase in operating complexities
- The sharp increase of the operations in the global supply chains

4. What is Supply Chain and What is Supply Chain Network?

"Supply Chain is the network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate consumer" - Martin Christopher

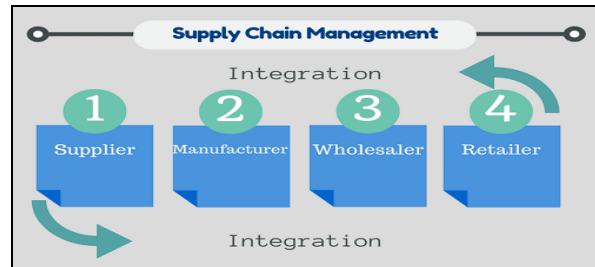
Each researcher defines supply chain management differently. However, we would like to provide the simple definition as below, "Supply Chain Management (SCM) refers to the coordination of production, inventory, location, and transportation among the participants in a supply chain to achieve the best mix of responsiveness and efficiency for the market being served"

⁵ Donald Bowersox, David Closs, M. Bixby Cooper, *Supply Chain Logistics Management*, McGraw-Hill 2012

⁶ Mentzer, J. T., DeWitt, W., Keebler, J. S., Min, S., Nix, N. W., Smith, C. D., & Zacharia, Z. G. (2018). Defining supply chain management. *Journal of Business logistics*, 22(2), 1-25.

-Michael Hugos". Many companies have the department that controls supply chain activity so they believe that SCM is a "function". Some companies think SCM is a kind of management system under IT (information system or enterprise resource planning.) In fact, SCM is actually a "network" consists of many players as below.

Picture 8. Integration Supply Chain Management



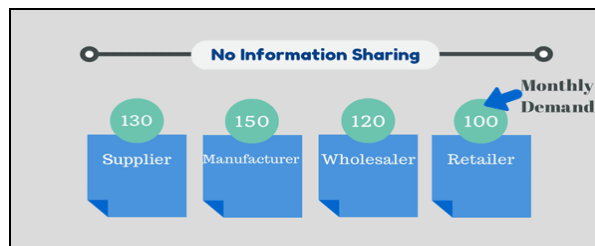
Sources: Simchi-Levi, D., Kaminsky, P., Simchi-Levi, E., & Shankar, R. (2017). Designing and managing the supply chain: concepts, strategies and case studies. Tata McGraw-Hill Education

A generic supply chain structure is as simple as Supplier, Manufacturer, Wholesaler and Retailer (it's more complex in the real world but a simple illustration serves the purpose.) The word "management" can be explained briefly as "planning, implementing, controlling". Supply Chain Management (in supply chain education context) is then the planning, implementing and controlling the networks.⁷

What is Information Sharing?

Another important attribute of supply chain management is the flow of material, information, and finance (money). Even though there are 3 types of flow, the most important one is information flow aka information sharing. Let's see the example of this through the simplified version of the bullwhip effect as below,

Picture 9. Bullwhip effect

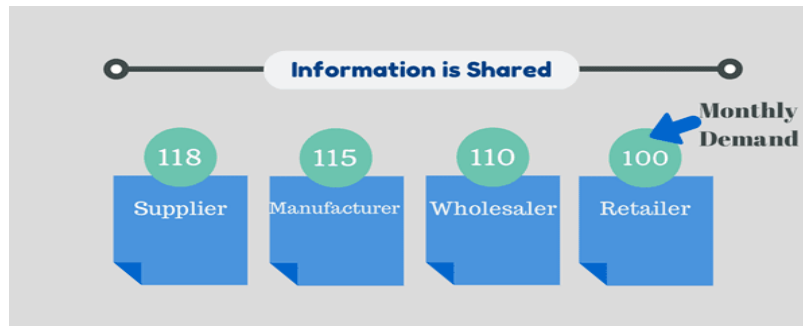


Sources: Coyle, John J., Edward J. Bardi, and C. John Langley, Jr. The Management of Business Logistics: A Supply Chain Perspective. Mason, OH: South-Western Thomson Learning, 2015.

⁷ Simchi-Levi, D., Kaminsky, P., Simchi-Levi, E., & Shankar, R. (2017). Designing and managing the supply chain: concepts, strategies and case studies. Tata McGraw-Hill Education

When customer demand data is not shared, each player in the same supply chain must make some sort of speculation and this can become the management issues. According to the above graphic, the retailer has a demand for 100 units, but each player tends to keep stock more and more at every step of the way. This results in higher costs for everyone in the same supply chain.⁸

Picture 10. Results in higher costs for everyone in the same supply chain



Sources: Coyle, John J., Edward J. Bardi, and C. John Langley, Jr. *The Management of Business Logistics: A Supply Chain Perspective*. Mason, OH: South-Western Thomson Learning, 2015.

When information is shared via demand management from retailer down to supplier, everyone doesn't have to keep stock that much. The result is a lower cost for everyone.

This is sometimes called the extended supply chain or supply chain visibility. Information sharing will also reduce the needs to use the digital transformation solution such as supply chains systems, digital supply chain, predictive analytics or artificial intelligence. Information sharing requires a certain degree of "coordination" (it's also referred to as collaboration or integration in scholarly articles). Do you wonder when people started working together as a network? In 1984, companies in the apparel business worked together to reduce overall lead-time. In 1995, companies in the automotive industry used Electronic Data Interchange to share information. So, working as a "chain" is the real world practice.

What are Conflicting Objectives?

Working as a network requires the same objective, but this is often not the case (even with someone in the same company). "Conflicting Objectives" is the term used to describe the situation when each function wants something that won't go well together. For example, purchasing people always place the orders to the cheapest vendors (with a very long lead-time) but production people or project manager need material more quickly. To avoid conflicting objectives, you need to decide if you want to adopt a time-based strategy, low-cost strategy or differentiation strategy. A clear direction is needed so people can make the decisions accordingly. The concept of Cost/Service Trade-off appeared as early as in 1985 but it seems that people really don't get it.

⁸ Coyle, John J., Edward J. Bardi, and C. John Langley, Jr. *The Management of Business Logistics: A Supply Chain Perspective*. Mason, OH: South-Western Thomson Learning, 2015.

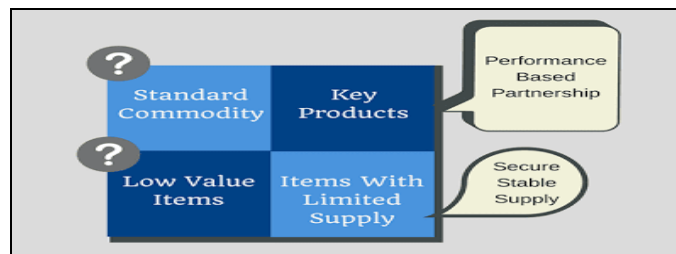
When you want to improve service, the cost goes up. When you want to cut cost, service suffers. It's like a "seesaw", the best way you can do is to try to balance both sides.

Real world example is that a "new boss" ask you to cut costs by 10%, improve service level by 15%, double inventory turns so the financial statement looks good. If you really understand the cost/service trade-off concept, you will agree that you can't win them all. The most appropriate way to handle this is to prioritize your KPIs.⁹

To work as the same team, long-term relationship is key. Otherwise, you're just a separate company with a different strategy/agenda. So academia keeps preaching about the importance of relationship building but is not for everyone.

Since there are too many suppliers to deal with, a portfolio matrix is often used to prioritize the relationship building to create supply chain partners. Focus your time and energy to create a long-term relationship with suppliers of key products and items with limited sources of supply (or items with high supply chain risk.) Because people and human resource are the factors that can make or break your supply chain. Is this the most comprehensive definition of logistics and supply chain management?

Picture 11 What is the Cost/Service Trade-off?



Sources: R.G. Poluha: The Quintessence of Supply Chain Management: What You Really Need to Know to Manage Your Processes in Procurement, Manufacturing, Warehousing and Logistics (Quintessence Series). First Edition. Springer Heidelberg New York Dordrecht London 2016. [ISBN 978-3-662-48513-2](#)

The concept of logistics as a business discipline began to appear in the business-related literature in the 1960s when it was called physical distribution. At that time its focus was on the outbound side of the logistics system. With the emerging importance of Supply Chain Management, logistics and transportation has become even more crucial as supply chain managers realize that the coordination and integration of the logistics systems of all organizations with the supply chain are requirements for success.

⁹ R.G. Poluha: The Quintessence of Supply Chain Management: What You Really Need to Know to Manage Your Processes in Procurement, Manufacturing, Warehousing and Logistics (Quintessence Series). First Edition. Springer Heidelberg New York Dordrecht London 2016. [ISBN 978-3-662-48513-2](#)

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